

10

World History  
History-Social  
Science Standard  
10.4.1.



# New Imperialism: The Search for Natural Resources

## **California Education and the Environment Initiative**

Approved by the California State Board of Education, 2010

### **The Education and the Environment Curriculum is a cooperative endeavor of the following entities:**

California Environmental Protection Agency  
California Natural Resources Agency  
Office of the Secretary of Education  
California State Board of Education  
California Department of Education  
California Integrated Waste Management Board

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## **Lesson 1    The Hydrogen Highway—Resources for a Revolution**

Key Unit Vocabulary .....	2
Parallels of Industrialization and the Hydrogen Highway .....	4

## **Lesson 2    Natural Resources for an Industrial Economy**

Evaluating the Need for Natural Resources in Industrial Economies .....	5
---	---

## **Lesson 3    Perspectives on the Control and Use of Natural Resources**

Primary Source Analysis Form .....	10
Differing Perspectives: The Control and Use of Natural Resources .....	12

## **Lesson 4    Tapping the Resources of the Rainforest**

Growing Rubber for Growing Industries .....	14
---	----

## **Lesson 5    The Tree That Saved an Empire**

Quinine and Global Implications of Imperialism .....	19
Part 2—Putting It All Together .....	20

## **Lesson 6    Conservation Efforts in British India**

Conservation in British India .....	22
Conservation in Contemporary California .....	24
Comparing Conservation in British India and Contemporary California .....	26



**Alternative energy:** Energy derived from sustainable sources, such as solar, wind, or water, rather than fossil fuels (petroleum-based fuels).

**Biological diversity (biodiversity):** A measure of the number of different species of organisms in a specific area, also used as a general description of species richness, ecosystem complexity, and genetic variation.

**Botanical gardens:** Public gardens that are used to collect, grow, study, and display plants from around the world.

**Carbon cycle:** The process by which carbon is exchanged between organisms and the environment (atmosphere, ocean, rocks, soil, and sediments).

**Conservation:** The management, protection, and use of resources and natural systems in a way that can meet current and future needs.

**Deforestation:** Clearing trees from a forested area.

**Denudation:** The practice of clearing an area of vegetation and forest cover.

**Ecosystem goods:** Tangible materials, such as timber and food produced by natural systems that are essential to human life, economies, and cultures.

**Ecosystem services:** The functions and processes that occur in natural systems, such as pollination, that support or produce ecosystem goods and help sustain human life, economies, and cultures.

**Fossil fuels:** Nonrenewable fuels, such as coal that formed from organic material over millions of years.

**Fuel cell:** A cell that produces a direct current from a chemical reaction between hydrogen and oxygen, which produces electric energy capable of fueling machines.

**Hegemony:** Leadership or dominance by one country or group over others.

**Herbalist:** A person who grows and collects herbs, especially medicinal herbs used to treat illnesses.

**Imperialism:** Political and military policies and practices that give one country control over the people, land, and resources in another region or country.

**Industrialization:** 1. Transformation of an economy from production of goods by human and animal labor to production by powered machines. 2. The changing of an area by creating industry, such as factories and power plants.

**Infrastructure:** The basic facilities and systems, such as railroads and power lines necessary to run an industrial economy.

**Latex:** A milky-colored fluid that is the sap of certain trees and other plants, such as rubber trees.

**Malaria:** A disease caused by a parasite called *Plasmodium* that occurs mostly in tropical areas, but can occur anywhere that mosquitoes thrive.

**Medicinal:** Chemicals, including pharmaceutical drugs, and other materials that can be used to treat illness or injury.

**Missionary:** A person acting to achieve and promote a specific purpose such as promoting a religion.

**Monopoly:** Sole control over a natural resource, good, service, or industry.



## Key Unit Vocabulary

Lesson 1 | page 2 of 2

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**Natural resources:** Materials, such as water, minerals, energy, and soil that people use from nature and natural systems.

**Parasite:** An organism that lives on or in a host organism and can only survive through the nutrients taken from the host.

**Quinine:** A chemical extracted from the bark of *Cinchona* trees and used to prevent or treat malaria.

**Strategic:** A well-thought-out plan or action intended to achieve a particular goal.

**Tropical rainforest:** Lush, dense forests found in the region that lies between the Tropic of Cancer (23.5° north) and the Tropic of Capricorn (23.5° south).

**Urbanization:** The changing of rural and natural areas to densely populated urban areas as a result of large-scale migration to cities.

## Parallels of Industrialization and the Hydrogen Highway

### Lesson 1

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Name: \_\_\_\_\_

**Instructions:** Answer the following questions based on ***California Connections: Paving the Way for a Cleaner Tomorrow*** and what you already know about the Industrial Revolution. (2 points each)

1. What pressures are encouraging the development of hydrogen fuel in California?

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2. Why was hydrogen chosen as a source of fuel?

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3. What role do the federal and state governments play in developing the “Hydrogen Highway”?

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4. Is the United States the only nation in which people are pursuing hydrogen as a fuel source?  
How do you know?

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5. Why do you think that some nations have access to resources including fuels while others do not?

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6. What is the shared vision for the future in the attempts to create hydrogen networks, as stated in ***California Connections: Paving the Way for a Cleaner Tomorrow***?

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Name: \_\_\_\_\_

### Background

The Industrial Revolution greatly increased the need for natural resources. As countries expanded their economies and modernized their infrastructures, they required more raw materials. Limited natural resources at home motivated industrial powers such as the United States, Japan, and many European nations to look elsewhere to get the materials needed to industrialize. Industrialization included such tasks as manufacturing goods, building factories, railways, and ships, and constructing communication lines. Additionally, industrialization led to urbanization as increasing numbers of workers moved to cities where there were factories and work.

Most of the natural resources discussed in this lesson are ecosystem goods. These materials are essential to people because they provide such necessary items as food and fuel. Ecosystem goods are made possible by ecosystem services, which are natural processes that support or produce the goods that help sustain human life, economies, and cultures. Without ecosystem services like pollination and the water cycle, people would not have the natural resources needed for their survival.

Industrializing nations desired specific ecosystem goods to satisfy their growing populations' needs and to promote economic growth. Each of these goods depended in turn on specific ecosystem services. Natural resources were needed to:

1. Provide fuel to run industrial machines
  - ecosystem goods desired: coal, wood
  - related ecosystem services: pest and disease control, water cycle, decomposition
2. Provide raw materials for manufacturing
  - ecosystem goods desired: wood, latex (natural rubber), cotton, palm oil, iron ore
  - related ecosystem services: nutrient cycling, maintenance of diverse varieties of plants, water cycle
3. Provide food for growing populations in imperial countries
  - ecosystem goods desired: wheat (grains), tea, cacao, coffee, sugar
  - related ecosystem services: nutrient cycling, pest and disease control, seed dispersal, water cycle
4. Provide medicinal remedies for epidemic diseases
  - ecosystem goods desired: quinine (medicinal plants)
  - related ecosystem services: water cycle, nutrient cycling, maintenance of diverse varieties of plants, carbon sequestration
5. Provide a “laboratory” for scientific exploration (tropical medicine, map making, forestry, agriculture, geology, botany, zoology)
  - ecosystem goods desired: plants, soils, animals
  - related ecosystem services: water cycle, nutrient cycling, maintenance of diverse varieties of plants, pest and disease control

Natural resources became the primary need of the industrial nations. Access to such resources, ecosystem goods, and ecosystem services, then, became a necessary part of industrialization.



Name: \_\_\_\_\_

## Making a Chain

**Instructions:** Your group has a stack of cards. There are four categories of cards: industrialization cards, ecosystem goods cards, ecosystem services cards, and potential problems cards. Your task is to show relationships between industrialization, the environment, and challenges that might arise because of increased industrialization.

Follow these steps in order to demonstrate the relationships:

1. Separate your cards by category.
2. Read through the cards and discuss the ways in which some of them are related.
3. Make a “chain” by placing the cards next to each other to show the relationship between three or more of the cards.
4. On your worksheet, record the chain that your group creates by writing the title of each card.
5. Place arrows between each title. Underneath the chain, briefly describe the relationship between the cards.
6. Repeat until you create three chains. You may use the same card for more than one chain, and you do not have to use a card from each category for each chain.

For example, you might choose to link the following:

### Example 1

**Telegraph networks → copper → transportation networks**

#### Industrialization: Telegraph Networks

- The telegraph was a revolutionary way to communicate over long distances.
- Telegraph lines were laid along railway lines for ease of transport.
- A telegraph cable was successfully laid across the Atlantic to relay messages between America and Europe.
- The cable required copper and a natural latex from rubber trees native to Southeast Asia.
- The telegraph was used by the industrial nations and some of the colonies.

#### Ecosystem Goods: Copper

- The use of electrical power in the 1880s increased demand for copper. It is an excellent conductor of electricity and a logical element to use in telegraph lines.
- Copper smelting technology in the 20th century released sulfur dioxide into the atmosphere. This “smoke” that damaged the environment.
- Groundwater flowing through abandoned copper mines became tainted with acid. This acidified the soil and plant life that could grow in the water. It also affected underground reserves of copper.
- The second Industrial Revolution in Europe and U.S. found copper, which was needed for telegraph lines.

#### Industrialization: Transportation Networks

- Steamships, railways, and telegraph networks increased the movement of people, goods, and money all over the world.
- Railways and rivers allowed trains and steamships to break into the interior regions of Africa, Asia, and Latin America. This made natural resources in the colonies more available to imperial powers.

**Explanation:** Telegraph networks require copper because of its ability to conduct electricity, which requires a transportation network to access the copper mines in Africa.

Name: \_\_\_\_\_

## Example 2

**Cotton → large-scale irrigation → desertification and salinization → carbon sequestration**

### Ecosystem Goods: Cotton

- Cotton was a catalyst for the Industrial Revolution in Britain.
- Mechanized cotton spinning and weaving increased demand for cotton that could be produced in large quantities.
- Britain's need for cotton and African markets influenced its power and led to both regions.
- Cotton cultivation in arid climates and where these irrigation is required.

### Industrialization: Large-Scale Irrigation

- Irrigation is the artificial supply of water to crops, such as cotton.
- By the end of the 19th century, the world's food supply was largely dependent on irrigation.
- Nineteenth-century India was the first to use large-scale irrigation canals.
- Between 1870 and 1900, the area irrigated in India tripled.
- Industrial irrigation led to a buildup of salt levels, a process known as salinization. This can result in reduced agricultural productivity.

### Challenges: Desertification and Salinization

- Desertification (derived from the word "desert") is the degradation of dry land. This process is caused by a combination of climatic factors and human activities. These activities include water diversion, deforestation, and overgrazing.
- Salinization is the buildup of salts in soil. It becomes toxic to plants and can happen naturally from poor irrigation practices or human activities.
- Salinization can also occur because of high levels of irrigation water.

### Ecosystem Services: Carbon Sequestration

- Carbon sequestration is the process in which carbon in Earth's atmosphere is absorbed and stored in forests, soil, and the ocean.
- Oceans, forests, and soil "clean" Earth's atmosphere of extra carbon. Scientists therefore call these systems carbon "sinks."
- Deforestation and desertification can reduce the effectiveness of carbon "sinks."
- Naturally occurring carbon storage can reduce greenhouse gases that contribute to global warming.
- Fossil fuel-based industrialization has produced a surplus of carbon dioxide in Earth's atmosphere, contributing to global warming.

**Explanation:** As demand for textile goods increases, so does the demand for cotton. Increased cotton production requires methods of large-scale irrigation, which can contribute to desertification and salinization. Desertification can limit the process of carbon sequestration (absorption/collection of carbon in solid materials like plant tissue).

## Chains of Causality

Please list your group's three chains following the examples above. (5 points each chain)

### Chain #1:

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### Explanation:

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## Evaluating the Need for Natural Resources in Industrial Economics

Lesson 2 | page 4 of 5

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Name: \_\_\_\_\_

**Chain #2:**

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**Explanation:**

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**Chain #3:**

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**Explanation:**

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**Instructions:** Read and respond to the following questions. (5 points each)

1. How do ecosystem services and ecosystem goods work together to produce resources that people need?

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## Evaluating the Need for Natural Resources in Industrial Economics

Lesson 2 | page 5 of 5

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Name: \_\_\_\_\_

2. Why did industrializing nations seek natural resources in other countries?

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3. Why do you think providing medicines for diseases is considered a major role of natural resources in fueling industrialization?

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4. Explain the relationship between industrialization and ecosystem goods and services that you discovered in your group activity.

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## Primary Source Analysis Form

Lesson 3 | page 1 of 2

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Name: \_\_\_\_\_

### Part 1

**Instructions:** Read the document you have been assigned, then answer the following questions with the help of your group. (2 points each)

Source Document: \_\_\_\_\_

1. Who is the author? What do you know about the author?

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2. When was this document published?

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3. For what purpose was the document written? How might that affect the message?

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4. What is the main idea of the document? What is the author arguing?

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5. What is the document saying about the control and use of natural resources?

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## Lesson 3 | page 2 of 2

## Part 2

- national security and strategic advantage (political matters)
- moral issues raised by the search for national hegemony, Social Darwinism, and the missionary impulse (social matters)
- material issues such as land, resources, and technology (economic matters)

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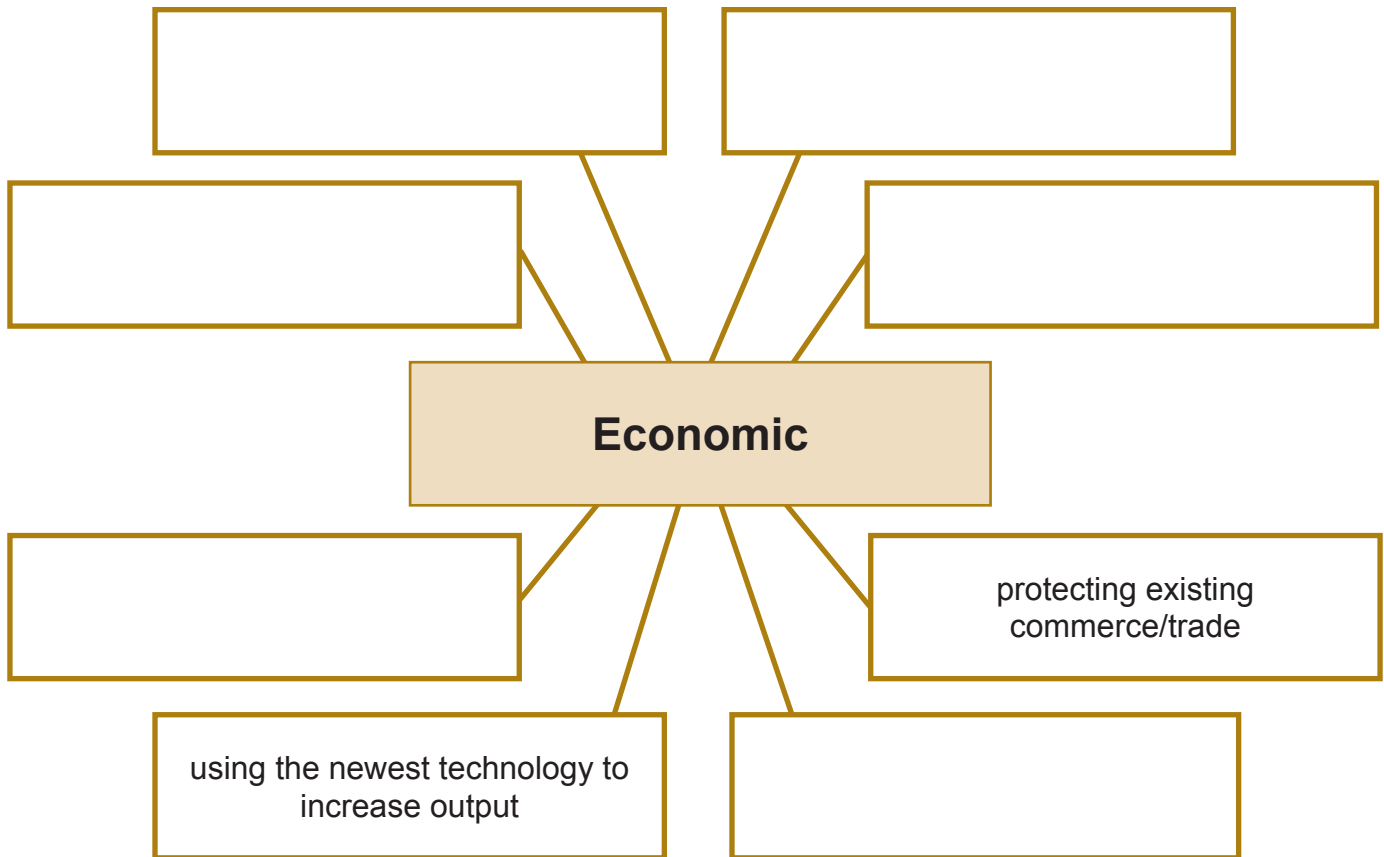


## Differing Perspectives: The Control and Use of Natural Resources

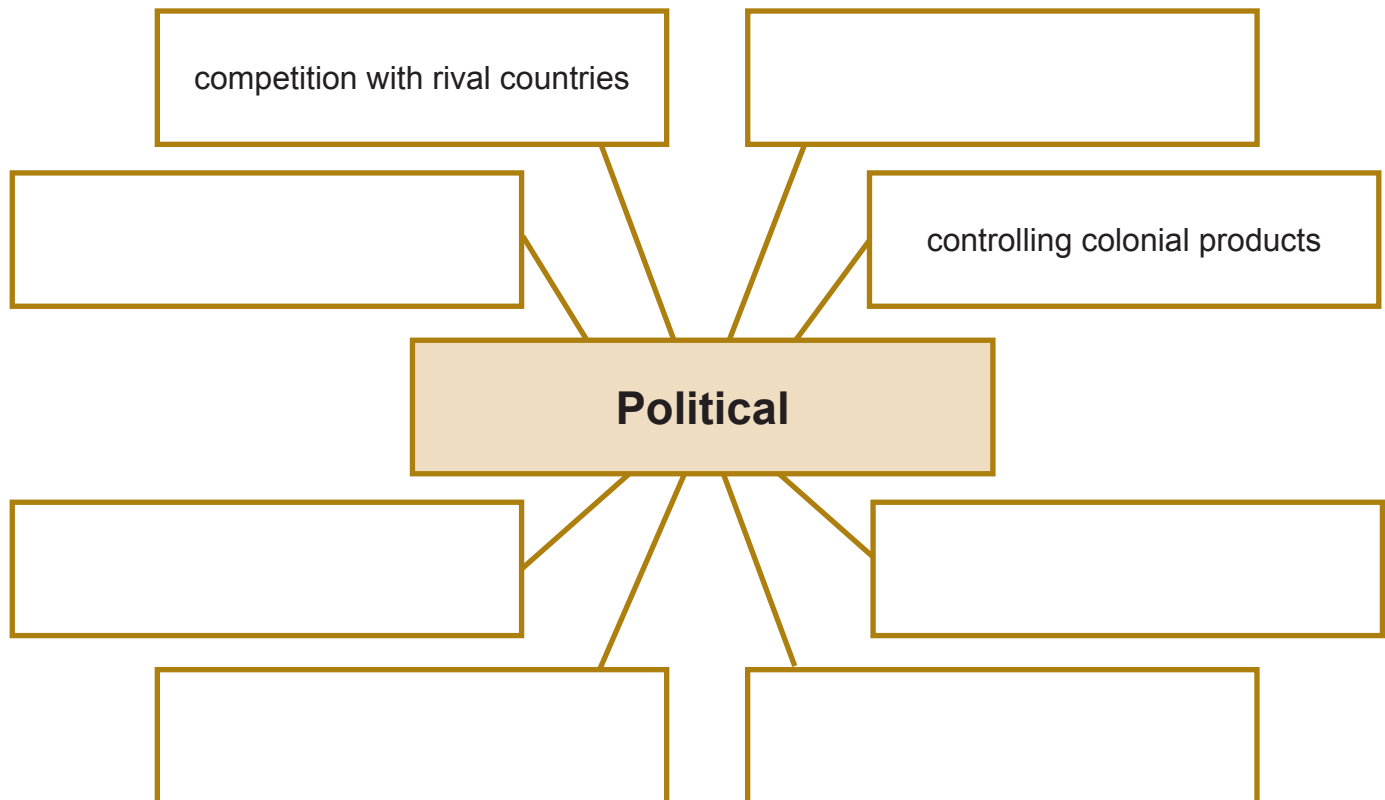
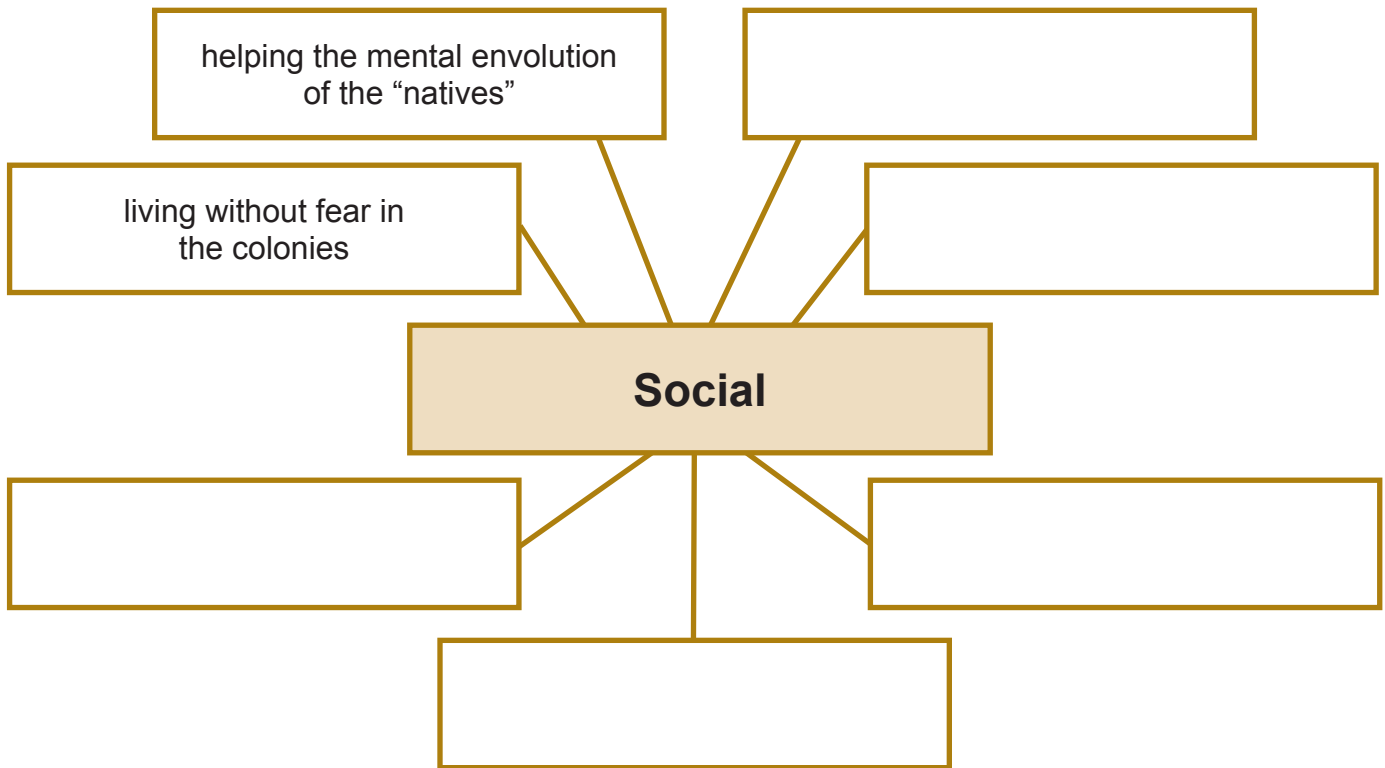
Lesson 3 | page 1 of 2

Name: \_\_\_\_\_

**Instructions:** Use the quotes shared in class to summarize the reasons imperial leaders used to justify colonizing other parts of the world. Each diagram has been started for you. Fill in the remaining spaces with details about each line of “reasoning.” (5 points per web)



Name: \_\_\_\_\_



## Growing Rubber for Growing Industries

Lesson 4 | page 1 of 5

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Name: \_\_\_\_\_

**Instructions:** Read the information cards in the folders your group receives. Respond to each of the questions below using the information provided on the associated information cards. (2 points each)

### Wild Rubber in the Brazilian Amazon

1. How is rubber “tapped”?

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2. In the early 1900s, where were most rubber trees in South America located?

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3. How many species of wild rubber trees are there in South America? What are their scientific names?

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4. Look at the map of wild rubber trees in South America. What do you notice about where they are located?

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### Human Innovation and the Changing Uses of Rubber

5. What innovation changed the properties of rubber?

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6. How did the new process make “gum” more useful?

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## Growing Rubber for Growing Industries

Lesson 4 | page 2 of 5

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Name: \_\_\_\_\_

7. What new products and uses were possible once rubber was vulcanized?

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8. As rubber became more useful, how did the rubber producers react?

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### The Automobile Industry

9. How was vulcanized rubber first used in the manufacture of automobiles?

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10. What was the advantage of using a conveyor belt?

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11. How many automobiles were produced in 1900? In 1920?

1900 = \_\_\_\_\_ 1920 = \_\_\_\_\_

12. By what percentage did the number of automobiles produced increase between 1900 and 1920?

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### Consumer Demand for Rubber Products

13. When was the car advertisement published? What is it announcing to consumers?

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## Growing Rubber for Growing Industries

Lesson 4 | page 3 of 5

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Name: \_\_\_\_\_

14. What audience does this car advertisement target?

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15. When was the shoe advertisement published? What is innovative about the brand of shoes at this time?

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16. What audience does this shoe advertisement target?

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## The Decline of the Amazonian Rubber Production

17. Which areas of the world exported the most rubber from 1890 to 1910?

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18. What happened to Amazonian rubber exports after 1910?

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19. By 1919, how did Amazonian rubber exports compare with the exports in 1900?

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20. What was the trend in world production of rubber between 1910 and 1919?

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Name: \_\_\_\_\_

**Plantation Rubber vs. Wild Rubber**

21. What was the world's main source of rubber after 1915?

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22. How was Amazonian rubber obtained?

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23. What is leaf blight?

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24. How did leaf blight affect the Amazonian rubber plantations?

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## Lesson 4 | page 5 of 5

25. Why did the Amazon rubber “boom” go “bust”?

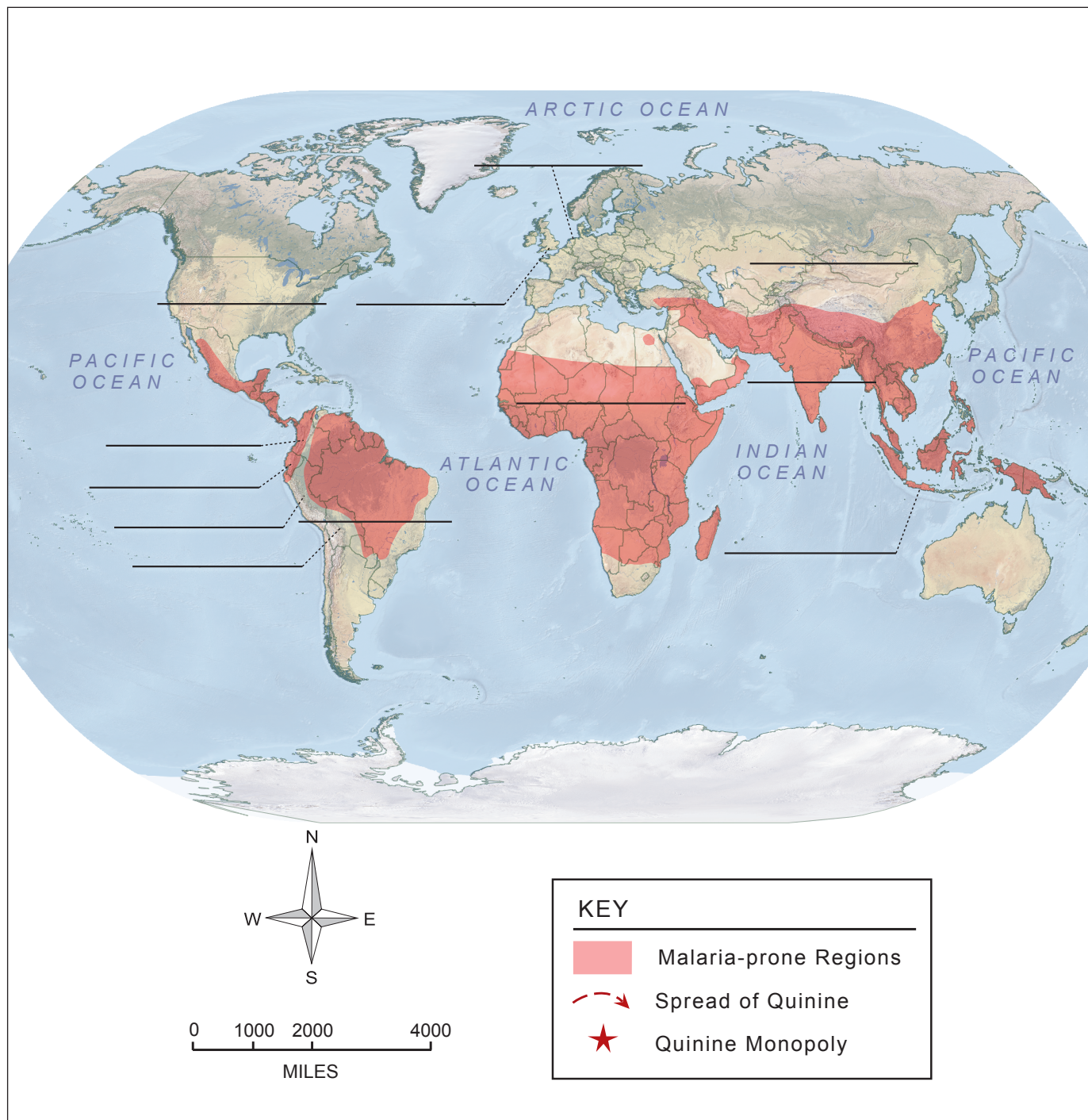
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## Quinine and Global Implications of Imperialism

### Lesson 5

Name: \_\_\_\_\_

**Instructions:** Follow the instructions on **Part 1—Mapping the History of Quinine** to complete this map. Use a world atlas to help you. (19 points total for all five mapping activities.)



## Part 2—Putting It All Together

### Lesson 5 | page 1 of 2

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Name: \_\_\_\_\_

**Instructions:** This lesson follows one natural resource, the *Cinchona* tree, as an example of the role that natural resources played in helping stimulate development of industrial economies. As the United States, Japan, and many European nations industrialized, other areas of the world provided natural resources to these nations. People around the world debated the various political, social, and economic reasons for direct control of such natural resources. As a result, industrial nations established colonies and created numerous policies that ensured continued access to sought-after resources such as the *Cinchona* tree. This is an interesting example of a tree that was transplanted to various colonies through government intervention and grown in great numbers for its valuable bark.

Answer the questions below to reinforce your understanding of this lesson. (3 points each)

1. What role did the *Cinchona* tree play in the rise of industrial economies in the 19th century?

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2. How did the cultivation of the *Cinchona* trees likely affect the natural systems and economies in the colonies?

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## Part 2—Putting It All Together

### Lesson 5 | page 2 of 2

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Name: \_\_\_\_\_

3. How did the desire for a continuous supply of quinine affect the decisions made by industrial powers about its control and use?

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4. What role did the imperial governments play in controlling the world supply of quinine?

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Name: \_\_\_\_\_

**Instructions:** Read the passages below taken directly from the book *Forestry in British India* by the Inspector General of Forests in India, Berthold Ribbentrop, written in 1900.

Respond to the questions below. (3 points each)

In 1865 the first Indian Forest Act was passed ...

It became evident that in order to effect the changes required, it was necessary to legislate in order to legalise the settlement and reservation of forest areas ...

The Forest Act provides for the constitution [forming] of Reserved forests and Protected forests.

That the wholesale destruction of forests has had the most deteriorating effect on the climate of India is certain ... There can be no doubt, whatever may be said to the contrary, that forests tend to increase the rainfall, and that in a warm-climate the denudation of a country diminishes its rainfall and consequently its fertility, is correct ... The ground was subsequently cleared for potato fields, and some fine crops of excellent potato crops were gathered. Now, however, the soil has been washed down into the ravines, the fields have to a great extent disappeared, and the barren hillside is cut up by the dry stony beds of Alpine torrents ...

... the withdrawal of man's active interference would, under favourable circumstances, be sufficient in time to re-clothe the now denuded areas with forest vegetation ...

Railways spread and forest growth disappeared with an incredible rapidity within the lines, partly on the account of the direct demands for them for constructive works and fuel ...

... with the advance of modern civilization, the demands both of the trade and of the population increased, whereas the forests diminished in size.

1. What time period is being discussed?

\_\_\_\_\_

2. What natural resources were in need of conservation?

\_\_\_\_\_

\_\_\_\_\_

3. What laws or policies previously provided environmental protection in India?

\_\_\_\_\_

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Name: \_\_\_\_\_

4. What has been the effect of natural resource overuse on the environment?

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5. What was the proposed solution?

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6. What influence did the Industrial Revolution and imperialism have on the environment?

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7. What spurred conservation efforts?

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Name: \_\_\_\_\_

**Instructions:** Read the passages below taken from the article you read during Lesson 1, *California Connections: Paving the Way for a Cleaner Tomorrow*.

Respond to the questions below. (3 points each)

The rapid industrialization of the last century, however, has created a surplus of carbon dioxide and other gases.

Federal and state laws regulate the emission of greenhouse gases ...

Drilling, transporting, and refining oil contributes to air pollution, and can alter and contaminate ecosystems. Burning fossil fuels for energy creates greenhouse gases, such as carbon dioxide.

The confluence of political, geological, and environmental pressures has made the search for fossil fuel alternatives a national imperative.

Government and industry have invested billions of dollars over the last few decades to find an alternative fuel that is practical, sustainable, and clean.

In 2004, California took the lead again by creating the California Hydrogen Highway Network (CaH<sub>2</sub>Net).

Much of our nation's oil supply comes from politically unstable regions. Some experts believe the world's oil reserves will be depleted within our lifetime. In addition, the remaining oil is getting more and more difficult to extract.

1. What time period is being discussed?

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2. What natural resources are in need of conservation?

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Name: \_\_\_\_\_

3. What laws or policies previously provided environmental protection in California?

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4. What was the effect of natural resource overuse on the environment?

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5. What is the proposed solution?

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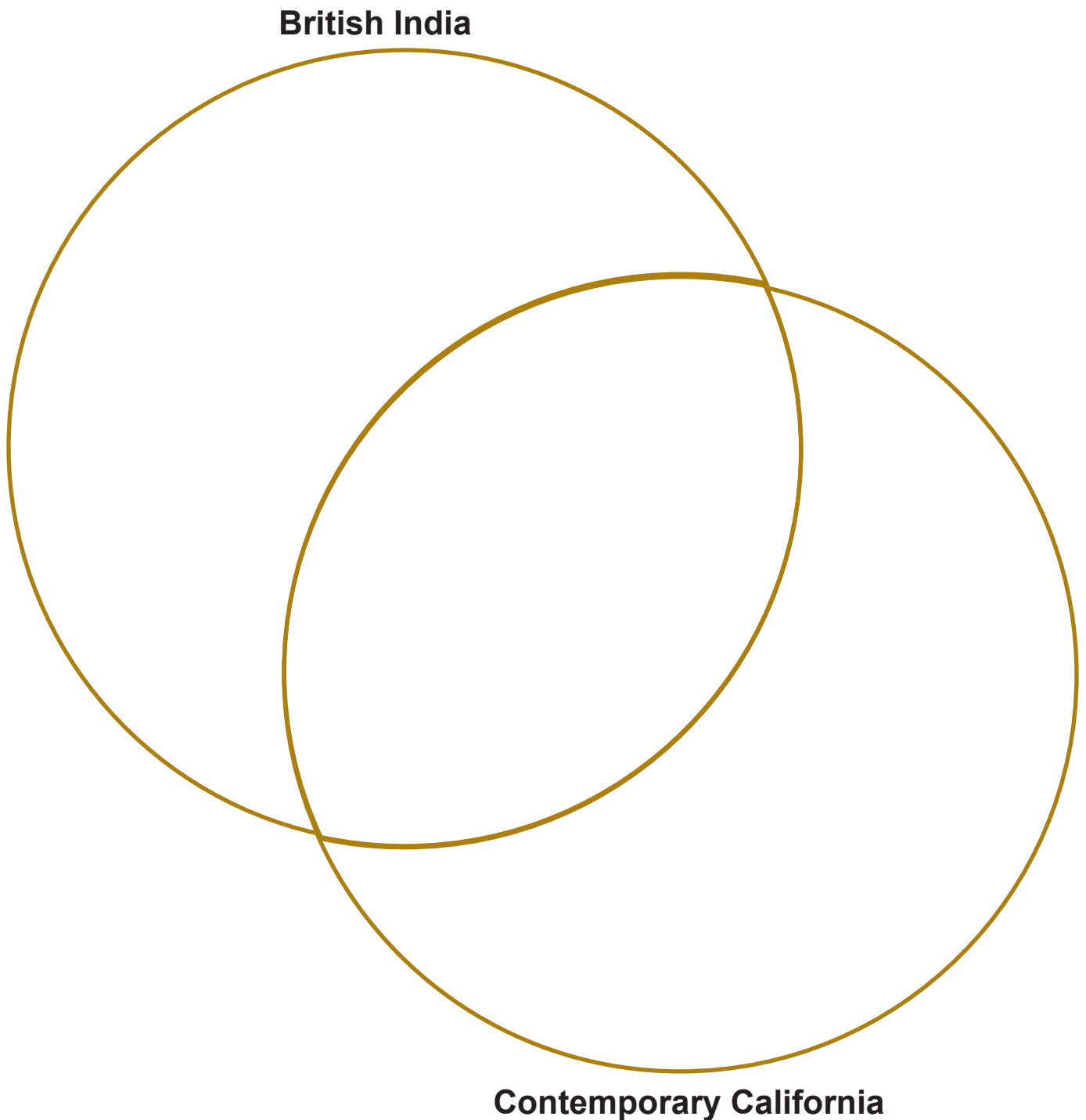
## Comparing Conservation in British India and Contemporary California

### Lesson 6

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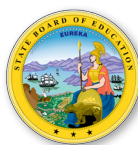
Name: \_\_\_\_\_

**Instructions:** Complete the Venn diagram below using information from today's lesson.









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## California Education and the Environment Initiative